

Review \supset Limits

$$\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2} = \lim_{x \rightarrow 2} \frac{2x}{1} = \underline{4}$$

plugin: $\frac{0}{0}$

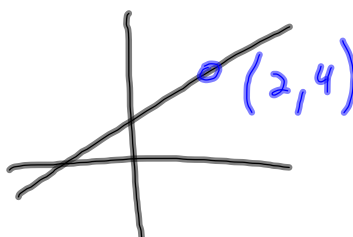
$f(2) = *$

hole since
limit exists
but $f(x)$ does not

or

$$\lim_{x \rightarrow 2} \frac{(x+2) \cancel{(x-2)}}{\cancel{(x-2)}} = 2+2 = 4$$

sketch $y = \frac{x^2 - 4}{x - 2}$



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explain

$$\lim_{x \rightarrow a} f(x) = L$$

to an alg 2 student

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$$\lim_{x \rightarrow 1^-} \frac{x}{x-1} = -\infty$$

$\nearrow 1$
 $\searrow 0$
 $\frac{1}{0} ?$

vertical asymptote
 $x=1$

$$\lim_{x \rightarrow \infty} \frac{x}{x-1} = 1$$

$\frac{\infty}{\infty}$

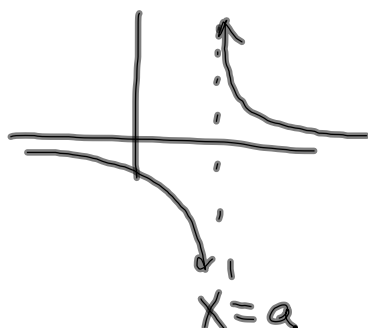
$$\lim_{x \rightarrow \infty} \frac{1}{1} = 1$$

Horiz. Asymptote
 $y=1$

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vertical asymptote

$$\lim_{x \rightarrow a} f(x) = \pm \infty$$

VA $x=a$ 

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Horiz. Asymptote

$$\lim_{x \rightarrow \pm\infty} f(x) = L$$

$$HA \quad y = L$$

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Find HA & VA of

$$y = \frac{x^2 - 4}{x^2 - 9}$$

$$HA \quad \lim_{x \rightarrow \infty} \frac{x^2 - 4}{x^2 - 9} = 1 \quad HA \quad y = 1$$

$$VA \quad x^2 - 9 = 0$$

$$x = 3$$

$$x = -3$$

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